



# PATENT SPECIFICATION

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## COMPLETE SPECIFICATION.

### Improvements in and relating to Joints for Rods and the like.

We, JOSEPH CHOPPINET, of No. 122, rue Washington, Brussels, Belgium, GUSTAVE GILLON, of 99, rue des Flamands, Louvain, Belgium, and VICTOR DEFAYS, of No. 143, rue Marconi, Forest, Brussels, Belgium, all of Belgian nationality, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to a joint for assembling rods or any other members and which is more particularly suitable for assembling the rods of drilling apparatus.

It is more especially in the latter apparatus, when a lot of rods are connected together, that the joints should satisfy the strictest conditions, more especially with regard to the facility and rapidity of the assemblage and dismantling of the members, to the accuracy of the relative position of the members to be assembled and maintenance of the said position even when the assemblage is subjected to a tensile or torsional stress, to the possibility of resisting considerable tensile and torsional stresses, to the necessity of reducing the dimensions of the assemblage to a minimum and to the necessity of taking a certain inclination under the influence of efforts exceeding a predetermined value when used in bore holes, for instance, which deviate from the vertical.

The joint according to the present invention answers completely the above conditions.

It belongs to the type of joints comprising two main parts, one of which is provided with a collar having a cylindrical head and the other with a cylindrical recess, into which the said head engages.

According to the present invention, the member containing the recess is provided

with a locking device which has for its effect, not only to lock the cylindrical head in the longitudinal direction, but also to press it against the walls of the recess, and on the other hand, the opening of the said recess is wider than the collar carrying the cylindrical head in order to allow of the latter effecting a slight rotation around its axis, under the action of any effort sufficient for overcoming the frictions due to the pressure exerted by the locking device.

A stop which is preferably fixed to the cylindrical head, allows of determining exactly the longitudinal position of the latter inside its recess. A locking device which comes into action when the head occupies the desired position inside its recess comprises two sliding nuts mounted on each side of the said recess and connected by a double screw, in such a manner as to come into engagement with a transverse groove cut in the cylindrical head. The latter is thus locked in the longitudinal direction. Each joint in the assemblage however possesses the desired flexibility in one direction because the head can slightly rotate in the recess if the effort which solicits it is sufficient for overcoming the adjustable resistance which is opposed by the pressure of the nuts. In order that this flexibility may give a universal joint effect when a member of rods are connected together, the joints are placed so that they may bend successively in planes at right angles.

In the accompanying drawings illustrating by way of example one mode of construction of a joint according to the present invention.

Fig. 1 is a vertical section, and Fig. 2 is an elevation with partial section along a plane perpendicular to that of Fig. 1.

A and B are the two parts of the joint which are rigidly connected, by means of connections U and V for instance, to the rods or other members to be assembled.

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The member A is provided with a head T of cylindrical shape which fits with longitudinal sliding on the member B. which to this end is provided with a cylindrical recess, the opening O of which is narrower than the diameter of the head T, and surrounds the collar Q connecting the head to the body of the member A. The head T is provided with a projection H which, when the members are assembled, slides in a groove G formed at the bottom of the cylindrical recess of the member B and abuts against the bottom of the said groove, thus determining the relative position of the members A and B, in which the connections U, V are exactly in a line with each other.

A second recess I of non-circular section is provided in the member B, cutting the top of the recess intended to receive the head T of the member A. The said recess I is adapted to receive two nuts E, E which are screwthreaded in opposite directions and are traversed by a double screw D the longitudinal displacement of which is prevented by a screw K, the end of which engages between two collars M, M integral with the screw D.

It follows from the said arrangement that if the screw D is rotated, for instance by means of a key fitted on its square bearing X, the nuts E will come nearer or move apart from each other by sliding in their recess L.

When the head T has been driven into the cylindrical recess of the member B until the projection H bears against the bottom of the groove G, a transverse groove K, which is provided around the head T comes exactly opposite the nuts E.

Therefore, if the screw D is then rotated in order to bring the nuts E nearer to each other, these nuts being preferably provided with bearing surfaces intended to follow exactly the curvature of the bottom of the groove K, they engage in the said groove and exert a pressure which will apply the head T firmly against the lower part of its recess, whilst the side walls of the groove K will be opposed to any longitudinal displacement of the head T.

As long as the screw D remains in the said position, the members A. and B cannot be separated.

In order that each joint may have a certain amount of flexibility in one direction, the opening O of the member B is made slightly wider than the opening of the collar Q of the member A, thereby enabling the latter to effect a rotation through a few degrees around the axis of the head A under the action of an effort which is sufficient for overcoming the

friction due to the pressure exerted on the nuts E. In order to make this flexibility have a universal joint effect when a number of rods are connected together, the successive joints may be placed at angles of 90° to one another.

C C are conical recesses provided in the member A for allowing the free suspension of the assemblage of rods from any stand having points adapted to fit said recesses when the deflection of the rods is to be measured.

It is easy to see that the described joint fulfils all the conditions mentioned at the beginning of the present description. It is of simple and strong construction and of an easy and rapid operation, and has the advantage of allowing an exact repositioning of the various members.

The play which exists between the walls of the opening O and the collar Q, imparts to the joint the flexibility which, when the successive joints are arranged to bend in different planes, will give a universal joint effect to a drilling apparatus composed of a number of rods which have to be lowered and rotated in drilling tubes, the length of which is often very considerable, and the axis of which deviates more or less from the vertical line.

It will lastly be noticed that any tensile stress exerted on the member A along the axis of the connection U, will have for its effect better to apply the head T against its seat and may, therefore, contribute to maintain the relative position of the members.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A joint for assembling rods and other members subjected to tensile or torsional stresses consisting of two members, one of which is provided with a collar having a cylindrical head and the other with a cylindrical recess intended to receive the said head, characterised in this that a locking device is mounted in the member provided with the recess, which locking device effects at the same time the locking of the cylindrical head in the longitudinal direction and presses it against the walls of its recess, the opening of the said recess being wider than the collar of the cylindrical head, in order to allow of the head effecting a slight rotation around its axis under the action of any effort sufficient for overcoming the friction due to the pressure exerted by the locking device.

2. A joint as claimed in Claim 1, characterised in this that the longitudinal posi-

tion of the head in its recess is exactly determined by bringing a stop which is integral with the head against a stop which is integral with the recess.

- 5 3. A joint as claimed in Claims 1 or 2, characterised in this that the locking device consists of two sliding nuts mounted at each side of the cylindrical recess and actuated by a double screw.
- 10 4. A joint as claimed in Claim 3, characterised in this that the cylindrical

head is provided with a transverse groove adapted to receive the bearing-surfaces of the nuts when the head is placed in position in its recess.

- 15 5. A joint for assembling rods or other members subjected to tensile or torsional stresses, constructed, arranged and working substantially as described with reference to the accompanying drawings.
- 20 Dated this 29th day of June, 1921.

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Fig.1.

Fig.2.

[This Drawing is a reproduction of the Original on a reduced scale.]

